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07/29/1999

ROBERT P. PARKER

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EXAMINER

TRAN, KHANH C

ART UNIT

PAPER NUMBER

2631

DATE MAILED: 01/24/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/364,241

Applicant(s)

ROBERT P. PARKER

Examiner

Khanh Tran

Art Unit

2631

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 24 September 2004.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-15 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-15 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 10 May 2002 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

1. The Amendment filed on 09/24/2004 has been entered. Claims 1-15 are pending in this Office action.

Response to Arguments

2. Applicant's arguments, see the Remarks, filed 09/24/2004, with respect to claim 11 under 35 U.S.C 112, 2nd paragraph, have been fully considered and are persuasive after Applicant amended claim. The rejection of claim 11 has been withdrawn.

3. Applicant's arguments filed on 09/24/2004 have been fully considered but they are not persuasive. The following response addresses Applicant's arguments in the Remarks:

Before responding to Applicant's arguments, referring back to Imazeki invention, as recited in the last Office action, Imazeki invention is directed to radio frequency receiver comprising circuit means for developing a gating signal when a radio-frequency signal receiver is tuned to the center-frequency of a selected radio-frequency signal.

As discussed in the Background of the Invention, it is well known that when an AM or FM receiver, for example, is tuned to a frequency somewhat removed from the center frequency of the selected station or channel, a significant amount of

undesired noise is present in an audio output of the receiver. As the receiver is tuned to frequencies closer to the center frequency, the audio output becomes less noisy until the optimum is attained at or very near the center frequency; see column 1, lines 5-20.

Imazeki further discusses problems in a conventional scanning circuit that it is extremely difficult to adjust such a circuit so that it stops the scanning operation when a preset level of signal strength to provide optimum tuning (e.g. center-frequency) for all signals of interest; see column 1, lines 44-65. The scanning receiver taught in Imazeki invention is controlled to tune to each of desired frequency and stop when it has tuned to the center frequency of a received frequency (a selected station or channel); see column 5, lines 19-50.

To implement the teachings, a center frequency detector 30 as shown in figure 3 employs a pair of voltage comparators 31 32 and an AND gate signal. The pair of voltage comparators 31 32 is to set up a range of frequency threshold for determining if the receiver tunes close to the center frequency with an acceptable signal level. Imazeki further expresses that the predetermined range can be very narrow, thus corresponding to the center frequency of the received signal; see column 6, line 57-68.

Contrary to the Applicant's arguments that *"the reference does not disclose comparing the frequency of the desired received signal to a threshold frequency as called for by all the rejected claims. Nor does the reference suggest the desirability of comparing the frequency of the desired received signal to a*

nonexistent threshold frequency", as recited in the last Office action, the comparators 31 32 perform the comparison step. The comparators 31 32 taught by Imazeki compares the frequency of the received signal through an FM audio detector 20 to a **threshold frequency, which is the center frequency of the received signal.**

Contrary to the Applicant's arguments that *"Nor does the reference disclose tuning the oscillator of the receiver to a frequency within the range of reception frequencies based on the nonexistent threshold frequency that is less or more than the received frequency when the received frequency is above and below the nonexistent threshold frequency, respectively as called for by claims. Nor does the reference suggest the desirability of modifying what is there disclosed to tune the oscillator of the receiver to a frequency within the range of reception frequencies based on the threshold frequency, that is less or more than the received frequency when the received frequency is above and below the threshold center frequency"*, as recited in the last Office action, in column 5 lines 19-67, the scanner circuitry 40 as shown in figure 2, provided between the switching circuit 23 (responsive to the signal developed by center frequency detector 30) and local oscillator 17, causes the variable tuning means to automatically and sequentially tune the receiver to the desired frequency which is the center frequency and stop when the scanner circuitry 40 tunes to the center frequency of a received frequency, *the center frequency corresponding to the claimed threshold frequency.* The variable tuning means as taught by Imazeki

includes the local oscillator 17 which as known in the art is utilized to tune to a frequency and produce a corresponding intermediate frequency signal.

Furthermore, a person of average skill in the art would recognize that by tuning the receiver to the center frequency of a received signal (*center frequency of the selected station or channel*), the scanner circuitry 40 inherently tunes the oscilloscope 17 of the receiver shown in figure 2 to the frequency within the range of reception frequencies based on the threshold center frequency, that is less or more than the received frequency when the received frequency is above and below the threshold center frequency.

Imazeki invention differs from the instant application in that Imazeki teachings tune the receiver to the center frequency of a received signal; the center frequency is *the center frequency of the selected station or channel*. The instant application calls for tuning a local oscillator of a receiver to a frequency with a frequency range based on a threshold center frequency of said frequency range. Nevertheless, since the receiver as taught by Imazeki tunes to the center frequency of a selected station or channel, it would have been obvious for one of ordinary skill in the art at the time the invention was made that "tuning to the center frequency of a selected station or channel" should correspond to "tuning to a frequency within a frequency range based on a threshold center frequency of said frequency range" as claimed in the instant application.

Regarding to the Applicant's arguments that "*while the standard FM reception band is from 88 to 108MHz, there is no disclosure that local oscillator 17 has a*

frequency always within 88-108Mhz, let alone that is less and more than the received frequency in that band when the received frequency is above and below the undisclosed threshold frequency”.

As recited above, Imazeki teachings are an improved system over conventional AM or FM receiver. As well known in the art, any signal can be frequency modulated or amplitude modulated in a frequency range. Imazeki teachings apply to frequency ranges including VHF and UHF (see column 3, lines 25-30), both ranges cover from 30 MHz to 3000 MHz. The range of 88-108Mhz is the entire range of FM reception. Imazeki receiver is tuned to the center frequency of a selected station or channel. In light of the foregoing discussion, a person of average skill in the art will recognize that local oscillator 17 is designed to be able to tuning to any frequency covered by the teachings.

In response to Applicant's argument that *“to the additional basis for rejecting claim 4, the reference does not disclose any information on tuning local oscillator 17, let alone applying one of at least two frequency offsets to the received frequency that is added when the received frequency is greater than and less than the threshold frequency, respectively, nor remotely suggest the desirability of modifying what is there disclosed to include this added limitation”*. Contrary to Applicant' arguments, in column 5, lines 30-50, in the embodiment of the invention illustrated in figure 2, scanning means in the form of scanner circuitry 40 and local oscillator 17 for causing the variable tuning means to automatically and sequentially tune

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the receiver to each of the desired frequencies and stop when it has tuned to the center frequency of a received frequency. As recited in the last Office action, Imazeki does not expressly disclose applying one of at least frequency offsets to the received frequency as claimed in the patent application. However, since adjusting the received frequency close to the center frequency requires adding or subtracting a frequency offset value, one of ordinary skill in the art would have recognized that scanner circuitry applies a frequency offset to add or subtract to the received frequency based on results from the comparison between DC component and the threshold value. Hence, there are at least two frequency offsets for adding and subtracting in light of the aforementioned reasoning.

In response to Applicant's argument that *"as to the additional basis for rejecting claim 5, there is not the slightest suggestion of providing the nonexistent first and second offsets as having the same magnitude"*. This is the case when the frequency of the received signal is at either end of the frequency range of a selected channel. In view of that, magnitudes of the frequency offsets on either end have the same magnitude in order to tune the received signal to the center frequency.

In response to Applicant's argument that *"regarding the additional grounds for rejecting claim 6, the reference does not disclose anything relating to first and second offsets being less than or equal to $(F_{HIGH} + -F_{LOW})/2$, or suggest the desirability of modifying anything there disclosed to meet this additional limitation in claim 6"*. As

recited in the last Office action, a range of frequencies of a selected station or channel is inherently bounded by high and low frequency values, defined by F_{HIGH} and F_{LOW} respectively. Since a threshold value in Imazeki invention is representative of center frequency, one of ordinary skill in the art will appreciate that mathematically, the first offset and second offset are equal or less than $(F_{\text{HIGH}} - F_{\text{LOW}}) / 2$. In light of the foregoing discussion, it is not necessary to modify Imazeki teachings to meet the claimed limitations.

In response to Applicant's argument that *"as to the additional limitation added by claim 7, the reference does not disclose that the first and second nonexistent frequency offsets are equal to an intermediate frequency of the receiver or suggest the desirability of modifying what is there disclosed to meet this added limitation"*, referring to figure 2, also in column 5, lines 19-50, the scanning receiver comprises variable tuning means in the form of antenna 12, RF amplifier 14, mixer and filter circuitry 16, local oscillator 17, and IF amplifier 18 to selectively and sequentially tune the receiver to the predetermined frequencies and produce a corresponding intermediate frequency signal. Because local oscillator 17 tunes the receiver to the predetermined frequencies and produce a corresponding intermediate frequency signal, it would have been obvious for one of ordinary skill in the art at the time the invention was made that the frequency offsets are equal to the intermediate frequency of the receiver.

In response to Applicant's argument that *"as to the rejection of claim 8, the*

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reasoning set forth above in support of the patentability of claim 1 is submitted to support the patentability of claim 8. The reference does not disclose the center frequency as a threshold frequency. The reference discloses the center frequency is that of the received signal (column 4, lines 65-68), which will dynamically change when the received signal changes as the user tunes to different stations. That is not the threshold frequency of the invention disclosed and claimed in this application. Nor does the reference disclose comparing the frequency of the desired received signal to the nonexistent threshold frequency and tuning the oscillator of the receiver to a frequency within the range of reception frequencies based on the threshold frequency, that is less and more than the received frequency when the received frequency is above and below the threshold frequency, respectively, wherein the range of frequencies is bounded by high and low frequencies FHIGH, FLOW respectively, the threshold frequency approximately equaling $FLOW + (FHIGH - FLOW)/2$, nor is there the slightest suggestion in the reference for modifying what is there disclosed to meet the limitations of this claim". The claim calls for "tuning the oscilloscope of the receiver to a frequency within the range of reception frequencies based on the threshold frequency...". Imazeki teachings tune the scanning receiver to the center of a received frequency signal, corresponding to a selected channel or station. In view of that, the teachings address the claimed limitations. As stated in the last Office action, claim 8 is rejected on the same ground as for claim 1 because of similar scope. Furthermore, in column 6, lines 32-67, the upper and lower threshold values are chosen to be very narrow, thus corresponding to the center frequency of the received signal (selected station or

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channel). In view of that the center frequency of a desired frequency range is equivalent to the claimed threshold frequency.

In response to Applicant's arguments that *"as to the rejection of claim 9, the reasoning set forth above in support of the patentability of claims 1 and 8 is submitted to support the patentability of claim 9, and nothing in the reference suggest the desirability of modifying what is there disclosed to meet the terms of claim 9, including that the range of frequencies is 2400MHz to 2485MHz inclusive. That range of frequencies is not specifically disclosed in the reference or the desirability of choosing that range"*. As stated in the last Office action, claim 9 is rejected on the same ground as for claim 1 because of similar scope. Imazeki expresses the teachings apply to frequency ranges including VHF and UHF (see column 3, lines 25-30), both ranges cover from 30 MHz to 3000 MHz. The range of frequencies as claimed in the patent application is within UHF band that covers from 2300 MHz to 3000 Mhz.

In response to Applicant's arguments that *"regarding claims 10 and 11, these claims call for the frequency controller being coupled to the local oscillator and the signal input for providing a frequency control signal to the local oscillator that always sets the frequency of the local oscillator to a frequency that differs from the frequency of the desired signal by the intermediate frequency and is within the predetermined frequency range. Nothing in the reference remotely discloses this limitation nor the desirability of modifying what is there disclosed to meet this limitation"*. Contrary to

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Applicant's arguments, In column 6 lines 1-25, see also figure 2, detecting means in the form of a center frequency detector 30 is coupled to an FM audio detector 20 and is responsive to a DC signal component developed by detector 20 for developing a control signal. Switching means in the form of switching circuit 23 is coupled to scanning circuitry 40 and is responsive to the gating signal from center frequency detector 30 for stopping the scanning only when the control signal has a value corresponding to the receiver being tuned to the center frequency of a desired signal (a selected station or channel). Scanner circuitry 40 causes the local oscillator 17 to tune the receiver to a desired frequency. In view of the foregoing disclosure, a person of ordinary skill in the art would have recognized that detecting means, switching means, and scanning means form a frequency controller as claimed in the patent application. The cited prior art elements perform the identical function specified in the claim in substantially the same way, and produce substantially the same results as the corresponding frequency controller disclosed in the specification. The equivalent frequency controller as taught in Imazeki invention is coupled to local oscillator 17 and potentiometers 35 36 which is a pre-selected voltage output representative of center frequency of a desired signal (a selected station or channel). Furthermore, the equivalent frequency controller always sets the frequency of the local oscillator 17 to a frequency that differs from the center frequency of a desired signal (a selected station or channel) by an IF frequency and is within the predetermined range of frequencies as appreciated by one of ordinary skill in the art.

In response to Application's arguments that "as to the additional grounds for rejecting claim 12, claim 12 is dependant upon and includes all the limitation of claim 11 so that further discussion is submitted to be unnecessary", the rejection from last Office action is recited in the following: "in column 5 lines 19-48, Imazeki discloses the scanner receiver embodiment in figure 2 including variable tuning means to selectively and sequentially tune the receiver to the predetermined frequencies and produce a corresponding IF signal. Imazeki discusses that several known techniques for implementing variable tuning means including programmable frequency synthesizer circuits for the local oscillator to tune the receiver to the desired frequencies. Imazeki discloses in the background of the invention that a synthesized frequency generating circuit sometimes takes the form of a phase-locked loop circuitry. Hence, one of ordinary skill in the art will appreciate that a phase-locked loop could be implemented in the local oscillator as claimed in the patent application".

In response to Applicant's arguments that "as to the rejection of claim 13, the reference fails to disclose a frequency controller coupled to the local oscillator and the signal path for providing a frequency control signal to the local oscillator that always sets the frequency of the local oscillator to a frequency that differs from that of a received signal within the predetermined frequency range by the intermediate frequency and is within the predetermined frequency range, nor does the reference suggest the desirability of modifying what is there disclosed to meet these limitations. Nor does the reference disclose modifying what is there disclosed to choose the predetermined

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frequency range as between 2440MHz to 2485MHz”, claim 13 is rejected on the same ground as for claims 10-11 because of similar scope. Furthermore, Imazeki expresses the teachings apply to frequency ranges including VHF and UHF (see column 3, lines 25-30), both ranges cover from 30 MHz to 3000 MHz. The range of frequencies as claimed in the patent application is within UHF band that covers from 2300 MHz to 3000 Mhz.

In response to Applicant's argument that *“like Imazeki, Imai fails to disclose comparing the frequency of the desired received signal to a nonexistent threshold frequency and tuning the oscillator of the receiver to a frequency within the range of reception frequencies based on the threshold frequency, that is less and more than the received frequency when the received frequency is above and below the threshold frequency, respectively as called for by claims 2 and 3 nor modifying what is there disclosed to meet these limitations of these claims. Nor does the reference disclose the frequency controller coupled to the local oscillator and the signal path for providing a control signal to the local oscillator that always sets the frequency of the local oscillator to a frequency that differs from that of a received signal within the predetermined frequency range by the intermediate frequency and is within the predetermined frequency range as called for by claims 14 and 15, nor suggest the desirability of modifying what is there disclosed to meet the limitations of these claims. Accordingly, withdrawal of the rejection of claims 2, 3, 14 and 15 as unpatentable over Imai is respectfully*

requested. If this ground of rejection is repeated, the Examiner is respectfully requested to quote verbatim the language in the reference regarded as corresponding to each limitation in each of these rejected claims, and quote verbatim the language in this reference regarded as suggesting the desirability of modifying what is there disclosed to meet limitation in these claims not present in the reference", referring to Imai et. invention, Imai et. teachings are similar to Imazeki teachings. Imai et. invention is directed to an automatic frequency control apparatus for tuning an FM receiver to a center frequency of a received signal, which is a selected band. As recited in last Office action; in column 6 line 61 through column 7 line 60; figure 4 illustrates an embodiment of a super high frequency (SHF) band FM receiver in Imai et al. invention. FM receiver includes an input terminal 10a for receiving a first IF signal, a FM demodulator 40 supplying demodulation output to a second low pass filter (LPF) 42.

Output of LPF 42 is representative of demodulation error voltage V_{de} , which is converted to a digital data value D_{de} through a 1st level shifter 66 and a first A/D converter 68. A reference voltage source 46a, corresponding to a center frequency of the second IF signal, is provided and is converted to a digital data value D_{ref} through a 2nd level shifter 70 and a second A/D converter 72. Imai et al. does not expressly disclose the step of comparing the frequency of the desired received signal to a threshold frequency as claimed in the patent application. Nevertheless, Imai et al. further teaches that the 1st level shifter 66 and the 2nd level shifter 70 match the demodulation error voltage V_{de} to the

reference voltage V_{ref} ; see column 7, lines 10-15. A microcomputer 48 calculates a demodulation sensibility S_d based on the digital data value D_{de} and the digital data value D_{ref} , and generates an automatic fine-tuning (AFT) data signal based on the result of the calculation to control the second local oscillator 24 to set a reception of the desired channel in the FM receiver. From the aforementioned teachings, the act of matching the 1st level shifter 66 and the 2nd level shifter 70 performs the function of the comparison step specified in the application claim. Because demodulation error voltage V_{de} is matched to the reference voltage V_{ref} , which corresponds to the center frequency of a received signal (selected band) and the result is used to generate a control signal to control local oscillator 24, the prior art element performs identical function specified in the claim in substantially the same way, and produces substantially the same results as the corresponding steps of "comparing the frequency of the desired received signal to a threshold" and "tuning the oscillator of the receiver to a frequency within the range of frequency ...". The reference voltage V_{ref} corresponds to the claimed threshold frequency and the demodulation error voltage V_{de} is representative of a demodulation error of the received signal. Further teachings disclose the microcomputer 48 supplies a channel tuning data to tune the second oscillator 24 to a frequency of the desired channel based on the comparison step of D_{de} and D_{ref} ; see column 7, lines 15-25. Claims 3, 14-15 are rejected for the same reasons as stated in last Office action.

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Below is the rejection of the last Office action, in which the current final rejection is based on:

Claim Rejections - 35 USC § 103

Claims 1 and 4-13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Imazeki U.S. Patent 4,245,348.

Regarding claim 1, Imazeki invention is directed to radio frequency receiver comprising circuit means for tuning the receiver to a plurality of frequencies within a range of frequencies which includes the selected signal and for producing an intermediate frequency signal corresponding to the frequency to which the receiver is tuned.

In column 3 lines 13-37, figure 1 illustrates a RF receiver receives an RF signal having a frequency within a range of frequencies. Imazeki further states that the frequency range may include frequencies from different designated frequency bands (e.g. VHF and UHF) to which it is desired to tune the receiver.

In column 3 lines 37-68, the RF receiver in figure 1 further includes a frequency discriminator means in the form of an audio detector 20 coupled to IF amplifier 18. The frequency discriminator is responsive the received intermediate frequency (IF) signal for developing an output signal which has a DC component directly proportional to the deviation of the IF frequency from the predetermined frequency. In column 4, lines 49-68, in accordance to one aspect of the invention,

the RF receiver in figure 1 further includes a detecting means in the form of center frequency detector 30 coupled to the audio detector 20 and responsive to the DC component, developed by an audio detector 20, for developing a gating signal. The gating signal has a first value when the DC component is between pre-selected upper and lower threshold values and has a second value when the DC component is not between the upper and lower threshold values. Imazeki further states that by selecting the upper and lower threshold values very close to each other in accordance with features of the invention, the receiver in figure 1 may be set to enable audio signal reproduction only when the receiver is tuned to or very close to the center frequency of the received signal. In light of the foregoing teachings, the step of selecting the upper and lower threshold values very close to each other forms an equivalent threshold value representative of the center frequency of a received frequency. Figure 3 illustrates the implementation of the center frequency detector 30 including a pair of voltage comparators 31 and 32 for setting the upper and lower threshold values.

Imazeki teachings do not expressly disclose the step of comparing the frequency of the desired received signal to a threshold frequency. Nevertheless, as recited above, the step of selecting the upper and lower threshold values very close to each other forms an equivalent threshold value representative of the center frequency of a received frequency. In column 6 lines 51-68, the DC component is applied to comparators 31 and 32, which produce a "low" output if the DC signal is more or less the equivalent threshold value and a "high" output if

the DC signal is very close to or at the equivalent threshold value. It would have been obvious for one of ordinary skill in the art at the time the invention was made that comparators 31 and 32 perform the step of comparing the DC component, which is representative of the frequency of a received signal, with the threshold value, which is formed by selecting the upper and lower threshold values very close to each other and represents the center frequency. It is not necessary to state a motivation since comparator, as well known in the art, perform the comparing step.

In column 5 lines 19-48, a scanner circuitry 40 in figure 2, provided between the switching circuit 23 (which is responsive to the signal developed by center frequency detector 30) and local oscillator 17, causes the variable tuning means to automatically and sequentially tune the receiver to the desired frequency which is the center frequency and stop when the scanner circuitry 40. The variable tuning means as taught by Imazeki includes the local oscillator 17 which as known in the art is utilized to tune to a frequency and produce a corresponding intermediate frequency signal. Hence, it would have been obvious for one of ordinary skill in the art at the time the invention was made that the variable tuning means causes the local oscillator 17 to tune to a frequency within the range of reception frequencies based on the comparison between the DC component and a threshold value (representative of a desired center frequency). The threshold value is more or less than the DC component, which is representative of the received frequency. Again, it is not necessary to state a

motivation since the local oscillator 17 performs the tuning process.

Regarding claim 4, as recited in claim 1, comparators 31 and 32 compare the DC component with the equivalent threshold value, formed by selecting the upper and lower threshold values very close to each other, to produce a "low" output when the DC component is more or less than the threshold, and a "high" output when the DC component is at or very close than the threshold. In the case of "low" output, a scanning means in the form of scanner circuitry 40 causes the variable tuning means to automatically and sequentially tune the local oscillator to the desired frequency. Imazeki does not expressly disclose applying one of at least frequency offsets to the received frequency as claimed in the patent application. However, since adjusting the received frequency close to a desired frequency requires adding or subtracting a frequency offset value, one of ordinary skill in the art will appreciate that scanner circuitry applies a frequency offset to add or subtract to the received frequency based on results from the comparison between DC component and the threshold value. Hence, there are at least two frequency offsets for adding and subtracting in light of the aforementioned reasoning.

Regarding claim 5, the threshold value is representative of the center frequency of a desired frequency. One of ordinary skill in the art will appreciate that there are numerous cases that both frequency offsets have the same magnitude, e.g. received frequency at either end of frequency range.

Regarding claim 6, a range of frequencies is inherently bounded by high and low frequency values, defined by F_{HIGH} and F_{LOW} respectively. Since a threshold value in Imazeki invention is representative of center frequency, one of ordinary skill in the art will appreciate that mathematically, the first offset and second offset are equal or less than $(F_{\text{HIGH}} - F_{\text{LOW}}) / 2$.

Regarding claim 7, since there is no specific range of frequencies in the claim, one of ordinary skill in the art will appreciate that the first and second frequency offsets are inherently equal to an intermediate frequency of the receiver.

Regarding claim 8, said claim is rejected using similar argument as in claim 1 because both claims have similar scope. Furthermore, the claimed threshold frequency is the center frequency, which is taught in Imazeki invention.

Regarding claim 9, said claim is rejected using similar argument as in claim 1 because both claims have similar scope. Furthermore, in column 3 lines 18-32, Imazeki invention applies to frequency bands such as VHF and UHF. The range of frequencies as claimed in the patent application is within UHF band that covers from 2300 MHz to 2900 Mhz.

Regarding claims 10-11, referring back to figure 2, an RF receiver includes a local oscillator 17, an antenna 12 for receiving an RF signal within a predetermined range of frequencies, an audio detector 20, detecting means in the form of a center frequency detector 30.

Imazeki does not expressly disclose a source of signal representative of the frequency of a desired signal, and a frequency controller for providing a frequency control signal as claimed in the patent application. However, Imazeki discloses center frequency detector 30 including a pair of voltage comparators 31 32 that are set by potentiometers 35 36. Since potentiometers 35 36 are adjusted to a pre-selected voltage output representative of center frequency of a desired signal, it would have been obvious for one of ordinary skill in the art at the time the invention was made that potentiometers 35 36 are the source of signal representative of the frequency of a desired signal.

In column 6 lines 1-25, detecting means coupled to local oscillator 17 through the scanner circuitry 40 and potentiometers 35 36 develops a control signal in responsive to a DC signal component developed by detector 20. The control signal controls scanning means in the form of a scanner circuitry 40 through switching means in the form of switching circuit 23 for stopping the scanning only when the control signal has a value corresponding to the receiver being tuned to the frequency of a desired signal. Scanner circuitry 40 causes the local oscillator 17 to tune the receiver to a desired frequency. Hence, one of ordinary skill in the art will appreciate that detecting means is equivalent to a

frequency controller as claimed in the patent application to due to similar functionalities. Furthermore, a mixer and filter 16 always sets the frequency of the local oscillator 17 to a frequency that differs from the frequency of a desired signal by an IF frequency and is within the predetermined range of frequencies.

Regarding claim 12, in column 5 lines 19-48, Imazeki discloses the scanner receiver embodiment in figure 2 including variable tuning means to selectively and sequentially tune the receiver to the predetermined frequencies and produce a corresponding IF signal. Imazeki states that several known techniques for implementing variable tuning means including programmable frequency synthesizer circuits for the local oscillator to tune the receiver to the desired frequencies. Imazeki discloses in the background of the invention that a synthesized frequency generating circuit sometimes takes the form of a phase-locked loop circuitry. Hence, one of ordinary skill in the art will appreciate that a phase-locked loop could be implemented in the local oscillator as claimed in the patent application.

Regarding claim 13, the scope of said claim is similar to that of claims 10-11. Rejection arguments of claims 10-11 also apply here. Furthermore, in column 3 lines 18-32, Imazeki invention applies to frequency bands such as VHF and UHF. The range of frequencies as claimed in the patent application is within UHF band that covers from 2300 MHz to 2900 Mhz.

Claims 2-3 and 14-15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Imai et al. U.S. Patent 4,959,872.

Regarding claim 2, in column 6 line 61 through column 7 line 60, figure 4 illustrates an embodiment of a super high frequency (SHF) band FM receiver in Imai et al. invention. FM receiver includes an input terminal 10a for receiving a first IF signal, a FM demodulator 40 supplying demodulation output to a second low pass filter (LPF) 42.

Output of LPF 42 is representative of demodulation error voltage V_{de} , which is converted to a digital data value D_{de} through a 1st level shifter 66 and a first A/D converter 68. A reference voltage source 46a, corresponding to a center frequency of the second IF signal, is provided and is converted to a digital data value D_{ref} through a 2nd level shifter 70 and a second A/D converter 72. Imai et al. does not expressly disclose the step of comparing the frequency of the desired received signal to a threshold frequency as claimed in the patent application. Nevertheless, Imai et al. further discloses that the 1st level shifter 66 and the 2nd level shifter 70 match the demodulation error voltage V_{de} to the reference voltage V_{ref} . A microcomputer 48 calculates a demodulation sensibility S_d based on the digital data value D_{de} and the digital data value D_{ref} , and generates an automatic fine-tuning (AFT) data signal based on the result of the calculation to control the second local oscillator 24 to set a reception of the desired channel in the FM receiver. From the aforementioned teachings, one of ordinary skill in the art will appreciate that the 1st level shifter 66 and the 2nd level

shifter 70 performs the comparison step as claimed in the patent application.

Also, it would have been obvious for one of ordinary skill in the art at the time the invention was made that the microcomputer 48 supplies a channel tuning data to tune the second oscillator 24 to a frequency of the desired channel based on the comparison step of Dde and Dref.

Imai et al. does not expressly disclose the step of converting the desired received signal frequency to an index value as claimed in the patent application. However, one of ordinary skill in the art would appreciate that the process of converting the demodulation error voltage Vde into a digital data value Dde would be equivalent to converting the desired received signal frequency to an index value since the converted digital data value is representative of the desired received signal frequency and the digital data value of reference voltage Vref is representative of center frequency of desired channel frequency. The SHF band carries a set of channels, hence, the received digital data value Dde would represent one of channels in the SHF band.

Regarding claim 3, claims 2-3 have similar scope, hence, the same rejection argument of claim 2 applies here. Imai et al. does not expressly disclose the step of representing the threshold frequency as an index value as claimed in the patent application. However, one of ordinary skill in the art would appreciate that converting the voltage reference Vde, corresponding to the center frequency of a desired channel frequency, into a digital data value Dref would be equivalent to representing the

threshold frequency as an index value. Since the SHF band carries a set of channels, a voltage reference V_{de} could be set to represent a center frequency of each channel in the SHF band.

Regarding claim 14, claims 2 and 14 have similar scope, hence, the same rejection argument of claim 2 applies here. As shown in figure 4, the SHF band FM tuner 42 in figure 4 includes an input terminal 10a, a local oscillator 24, a mixer 22, and a FM demodulator. The input terminal 10a, mixer 22, and a FM demodulator constitute a signal path as claimed in the patent application. One of ordinary skill in the art would appreciate that the components 2nd LPF 42, 1st level shifter, 1st A/D converter 68, reference voltage source 46a, 2nd level shifter 70, 2nd A/D converter, microcomputer 48 form the frequency controller as claimed in the patent application and those components are coupled between signal path and 2nd local oscillator. With the foregoing reasoning, microcomputer 48 corresponds to the microprocessor as claimed in the patent application.

Regarding claim 15, Imai et al. does not expressly disclose the microprocessor causes the frequency controller to add frequency offset values as claimed in the patent application. Nevertheless, Imai et al. teaches in column 7 lines 16-24 that the microcomputer 48 calculates a demodulation sensibility S_d based on digital signals D_{de} , corresponding to a received frequency, and D_{ref} , corresponding to a reference voltage representative of a center frequency of a desired channel. The microcomputer 48 generates an automatic frequency tuning (AFT) data signal $Daft$ based on the result

of the calculation to control the second local oscillator 24. From the foregoing teachings, one of ordinary skill in the art would appreciate that the microcomputer 48 would generate a Daft to add a frequency offset if Dde is less than a Dref and subtract a frequency offset if Dde is more than a Dref.

Conclusion

4. THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

5. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Khanh Tran whose telephone number is 571-272-3007. The examiner can normally be reached on Monday - Friday from 08:00 AM - 05:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mohammad Ghayour can be reached on 571-272-3021. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

KCT

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PRIMARY EXAMINER